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BIG TECH'S IMPACT ON INNOVATION TRAJECTORIES IN PLATFORM MARKETS: UNDERSTANDING THE DYNAMIC RELATION BETWEEN CORPORATE ACTIVITIES AND MARKET ACTIVITIES

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Working paper

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The authors fill a gap in previous studies by looking at the impact of mergers and acquisitions on startup activities and market reactions. Extending the scope of empirical analysis by investigating the investment intensity in the field of corporate venture capital, they support the thesis that the concept of dynamic relations is crucial in understanding the complex adaptive system of the digital economy.

1 | INTRODUCTION

The working paper is of relevance to all researchers of competition in the digital economy. It represents a successful attempt to depart from the static approach of neoclassical economics towards a more dynamic perspective in line with the learning of complexity theory. A first glance at the research question posed at the beginning of the paper is illustrative:

research question

How do incumbent Big Tech's corporate activities affect innovation trajectories and market activities in an industry?

The authors understand "Big Tech" to encompass the following companies: Google, Amazon, Microsoft, Apple, and Facebook.

> The companies were chosen because they (1) hold control over digital platforms and (2) conduct the most M&A activities.

- > The research question reflects an awareness of the dynamic relationships between the macro-, meso-, and micro-levels of competitive system, where the micro-level concerns corporations, the meso-level concerns a market, and the macro-level concerns an entire industry.
 - > The dynamic perspective of complexity economics is of great importance for public policy and regulation, as "understanding of competition as a multilevel system provides a broad lens on competitive and anticompetitive forces discarded in a single-level neoclassical antitrust evaluation" (Petit and Schrepel, 2022).
- > The paper also departs from exogenous growth theory, a key tenet of neoclassical economic stating that economic growth is fueled by technological progress independent of economic forces. Instead, the paper seeks to investigate the impact of Big Tech's corporate activities on the innovation dynamics in the software industry.
- > The paper not only fits into the current paradigm shift in economics, but also (and above all) fills a gap in the existing research by looking at the impact of mergers and acquisitions on startup activities and market reactions.

2 | RESEARCH GAP

At the beginning of the paper, the authors state that despite "many debates among scholars, as well as policy makers, about the effect of mergers and acquisitions (M&A) by incumbent firms on the market structure" no consensus has been reached (Guidi and Van der Veer, 2022).

- > While some research emphasizes the negative impact of acquisitions on the dynamics of innovation (Cunningham, Ederer and Ma, 2021), other work has put forward theoretical models pointing toward the possible positive effects (Motta and Shelegia, 2021).
 - > Cennamo et al suggest that the lack of consensus could be due to the fact that the impact of other corporate dominator activities, such as corporate venture capital (CVC), remains understudied. No research so far has properly analyzed how the sum of corporate investment decisions (CVCs and M&A activities) shapes the innovation trajectories.

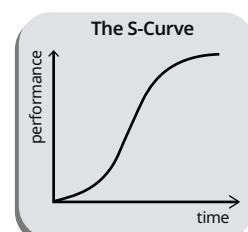
finding

The authors find that the corporate activities of Big Tech incumbents impact market activities differently depending on the underlying innovation's evolution stage.

3 | TECHNOLOGICAL EVOLUTION

The authors state as their objective "to document how corporate investment activities trigger different effects depending on the stage of the technological evolution and on the technological distance between the startups and the incumbents."

- > To illustrate the different stages of technological maturity, they use a revised **S-curve**.
 - > The S-curve was first described by Richard Foster, who developed a theory of the natural life cycle of technologies in his 1986 book *Innovation: The Attacker's Advantage*.
 - > Foster's theory was popularized twenty years later by complexity economist Eric Beinhocker: "In the early days of a new technology, performance is poor and progress slow. However, after a period of investment and tinkering with various designs, the performance and technology suddenly takes off on an exponential improvement curve."
 - > In *The Origin of Wealth: The Evolution, Complexity and the Radical Remaking of Economics*, Beinhocker recounts how the S-curve was confirmed by numerous observations and case studies, ranging from sailing ships to microprocessors.



- > The research question reflects an awareness of the dynamic relationships between the macro-, meso-, and micro-levels of competitive system, where the micro-level concerns corporations, the meso-level concerns a market, and the macro-level concerns an entire industry.

- > This approach to analyzing technological evolution distinguishes three periods: the fermentation period (after the first CVC event), the selection period (before the last CVC event), and the standardization period (after the M&A event).

4 | EMPIRICAL ANALYSIS

By extending the scope of their analysis with different events along the industry evolution, the authors obtain more complete results than previous studies have done. They adopt an event study approach and use the global-level Pitchbook dataset. The effects of Big Tech's corporate activity are examined in three milestones (the first CVC, the last CVC, and the M&A event) along the innovation trajectory in the software industry.

- > The authors reach the following conclusions:

- > Big Tech's corporate activities in the first CVC event have different positive impacts on market performance. They increase both the number of market entries and the financing of indirectly competing firms.
- > Big Tech's corporate activities in the last CVC event have a mixed impact on market performance, but they significantly decrease the number of market entries.
- > Big Tech's M&A event increases financing for companies competing with the acquiree, while decreasing the number of market entries (although this result is not statistically significant).

5 | CONCLUSIONS

The preliminary results presented in the paper show that the corporate activities of Big Tech incumbents have a mixed impact on market performance. It delivers two valuable contributions to the theoretical literature in the research areas of CVC, M&A, and innovation:

- 1 The paper enriches the ongoing debates on the impact of M&As by studying the sequential influence of the CVC activities before the M&A event.
- 2 The paper emphasizes the significant role of CVC, corporate activity, in shaping the whole industry's innovation trajectory.
 - > This is particularly important in the context of the ongoing debates on the paradigm shift in economics and its role in antitrust.

BIBLIOGRAPHY

- > Beinhocker, E. *The Origin of Wealth. The Evolution, Complexity and the Radical Remaking of Economics* (Random House Business Books, 2006).
- > Cunningham, C., Ederer, F. and Ma, S. (2021) 'Killer Acquisitions' Journal of Political Economy, 129(3).
- > Dosi, G. (1982) 'Technological Paradigms and Technological Trajectories: A Suggested Interpretation of the Determinants and Directions of Technical Change' Research Policy 11/3.
- > Foster, R. *Innovation: The Attacker's Advantage* (Summit Books, 1986)
- > Guidi, S and Van der Veer, A. (2022) 'Killer Acquisitions' DCI Literature Review, #LR1.
- > Motta, M. and Shelegia, S. (2021) 'The "Kill Zone": Copying, Acquisition and Startups' Direction of Innovation' BSE Working Paper 1253.
- > Nelson, R.R. and Winter, S.G. (1977) 'In Search of a Useful Theory of Innovation' in *Innovation, Economic Change and Technology Policies* (Birkhäuser).
- > Petit, N. and Schrepel, T. (2022) 'Complexity-Minded Antitrust' SSRN: <https://ssrn.com/abstract=4050536> or <http://dx.doi.org/10.2139/ssrn.4050536>.

The Revised S-Curve of Technology Evolution

